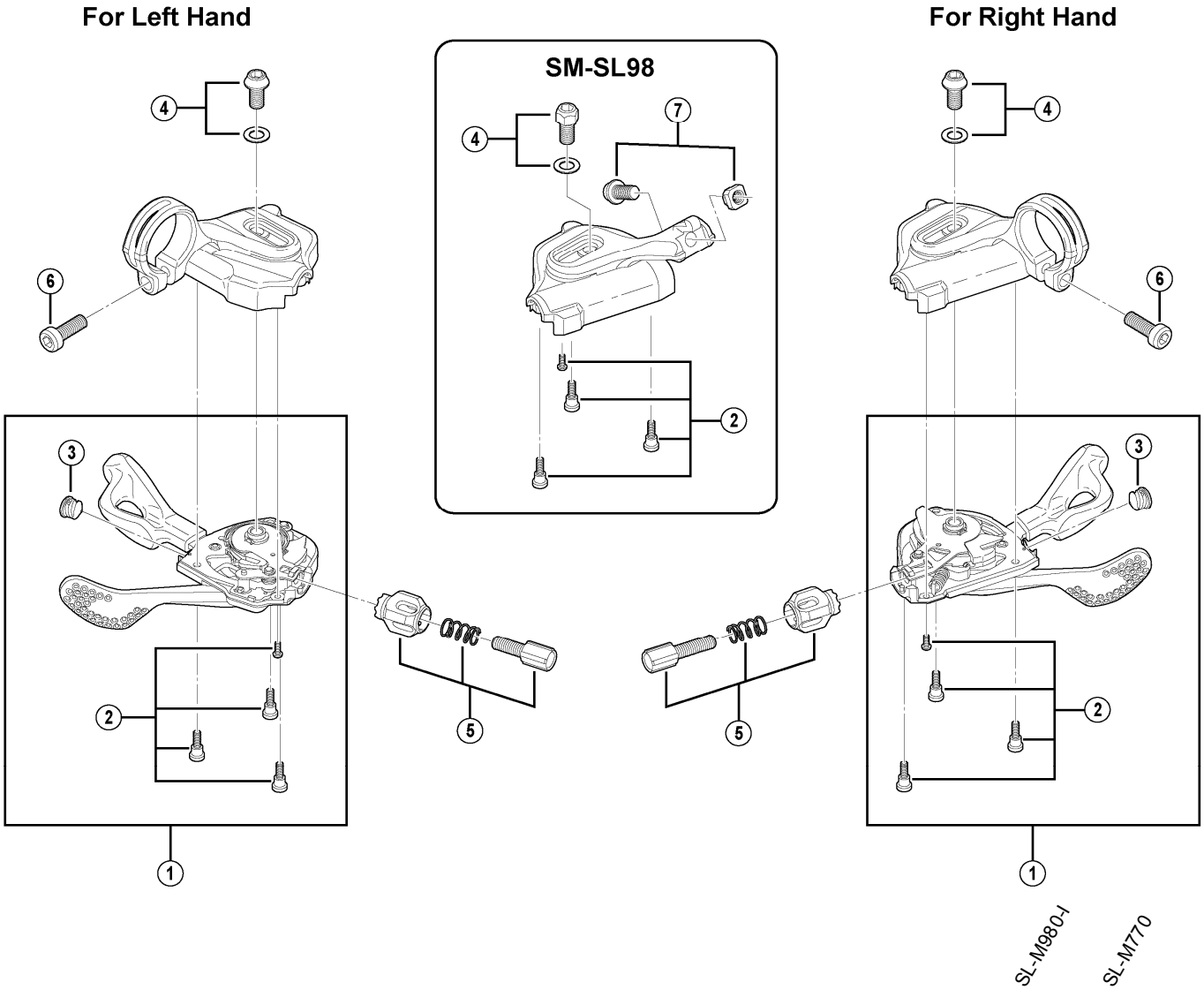
XTR Rapidfire Lever

SL-M980 Rapidfire Lever

SM-SL98 Ispec Bracket



ITEM NO.	SHIMANO CODE NO.	DESCRIPTION	INTERCHANGEABILITY		
1	**Y6T798010**	R.H. Shifting Lever Unit	A		
	Y6T898010	L.H. Shifting Lever Unit	A		
2	**Y6T798020**	Shifting Lever Fixing Screw Unit	A		
3	**Y6CD33000**	Inner Hole Cap	A	A	
4	**Y6T798030**	Unit Fixing Bolt (M5 x 9.5) & Washer			
	Y6T798050	Unit Fixing Bolt (M5 x 9.5) & Washer for SM-SL98	A		
5	**Y6T798040**	R.H. Cable Adjustting Bolt Unit	A		
	Y6T898020	L.H. Cable Adjustting Bolt Unit	A		
6	**Y6T842000**	Clamp Bolt (M5 x 13.5)			
7	**Y6T798060**	Bolt (M5 x 12.5) & Nut for SM-SL98	A		

A: Same parts.
B: Parts are usable, but differ in materirals, appearance, finish, size, etc.
Absence of mark indicates non-interchangeability.

Jun.-2010-3083

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Specifications are subject to change without notice.

SHIMANO

General Safety Information

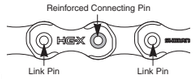
⚠ WARNING

"Maintenance interval depends on the usage and riding circumstances. Clean regularly the chain with an appropriate chaincleaner. Never use alkali based or acid based solvents such as rust cleaners. If those solvent be used chain might break and cause serious injury."

- **In order to obtain good gear shifting performance, this chain has a forward side and a reverse side, and the sides are marked so that the chain will face the correct way when installed. The proper design performance will be obtained when the chain is installed so that it faces the correct way. If it is installed so that it faces the opposite way, the chain may come off and the bicycle may fall over and serious injury may occur as a result.**
- Use the reinforced connecting pin only for connecting the narrow type of chain.
- If connecting pins other than reinforced connecting pins are used, or if a reinforced connecting pin or tool which is not suitable for the type of chain is used, sufficient connection force may not be obtained, which could cause the chain to break or fall off.

Chain	Reinforced connecting pin	Chain tool
10-speed super narrow chain for MTB	with groove (3) / with groove (2)	TL-CN32 TL-CN23 TL-CN27

- If it is necessary to adjust the length of the chain due to a change in the number of sprocket teeth, make the cut at some other place than the place where the chain has been joined using a reinforced connecting pin. The chain will be damaged if it is cut at a place where it has been joined with a reinforced connecting pin.



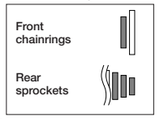
- Be careful not to let the cuffs of your clothes get caught in the chain while riding, otherwise you may fall off the bicycle.
- Check that the tension of the chain is correct and that the chain is not damaged. If the tension is too weak or the chain is damaged, the chain should be replaced. If this is not done, the chain may break and cause serious injury.
- The two left crank arm mounting bolts should be tightened alternately in stages rather than each bolt being fully tightened all at once. Use a torque wrench to check that the final tightening torques are within the range of 12 - 14 N·m. Furthermore, after riding approximately 100 km (60 miles), use a torque wrench to re-check the tightening torques. It is also important to periodically check the tightening torques. If the tightening torques are too weak or if the mounting bolts are not tightened alternately in stages, the left crank arm may come off and the bicycle may fall over, and serious injury may occur as a result.
- Check that there are no cracks in the crank arms before riding the bicycle. If there are any cracks, the crank arm may break and you may fall off the bicycle.
- If the inner cover is not installed correctly, the axle may rust and become damaged, and the bicycle may fall over and serious injury may occur as a result.
- **Obtain and read the service instructions carefully prior to installing the parts.** Loose, worn or damaged parts may cause the bicycle to fall over and serious injury may occur as a result. We strongly recommend only using genuine Shimano replacement parts.
- **Obtain and read the service instructions carefully prior to installing the parts.** If adjustments are not carried out correctly, the chain may come off and this may cause you to fall off the bicycle which could result in serious injury.
- Read these Technical Service Instructions carefully, and keep them in a safe place for later reference.

⚠ CAUTION

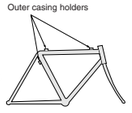
- If the chain is on the smallest or intermediate chainring, there is the danger of injury from the tips of the teeth on the largest chainring.

Note

- In addition, if pedaling performance does not feel normal, check this once more.
- Before riding the bicycle, check that there is no play or looseness in the connection. Also, be sure to retighten the crank arms and pedals at periodic intervals.
- If a squeaking noise is heard coming from the bottom bracket axle and the left crank arm connector, apply grease to the connector and then tighten it to the specified torque.
- Use a neutral detergent to clean the crank arm and the bottom bracket. Using alkaline or acidic detergents may cause discoloration.
- Do not wash the bottom bracket with high-pressure jets of water.
- If you feel any looseness in the bearings, the bottom bracket should be replaced.
- If gear shifting operations do not feel smooth, wash the derailleur and lubricate all moving parts.
- If the amount of looseness in the links is so great that adjustment is not possible, you should replace the derailleur.
- You should periodically wash the chainrings in a neutral detergent and then lubricate them again. In addition, cleaning the chain with neutral detergent and lubricating it can be an effective way of extending the useful life of the chainrings and the chain.
- If the chain keeps coming off the chainrings during use, replace the chainrings and the chain.
- When the chain is in the position shown in the illustration, the chain may contact the front chainrings or front derailleur and generate noise. If the noise is a problem, shift the chain onto the next-larger rear sprocket or the one after.



- For frames with suspension, the chain stay angle will vary depending on whether the bicycle is being ridden or not being ridden. When the bicycle is not being ridden and the chain is positioned on the largest/larger chainring and on the smallest sprocket, the chain guide outer plate of the front derailleur may touch the chain.



- The cuffs of your clothing may get dirty from the chain while riding.
- Apply grease to the left and right adapters before installing them.
- For smooth operation, use the specified outer casing and the bottom bracket cable guide.
- The front derailleur is for double front chainwheels only. It cannot be used with triple front chainwheels, as the shifting points will not match.
- When installing the top route type, choose a frame that has three outer casing holders as shown in the illustration at right.
- Use an outer casing which still has some length to spare even when the handlebars are turned all the way to both sides. Furthermore, check that the shifting lever does not touch the bicycle frame when the handlebars are turned all the way.
- A special grease is used for the gear shifting cable. Do not use DURA-ACE grease or other types of grease, otherwise they may cause deterioration in gear shifting performance.
- Grease the inner cable and the inside of the outer casing before use to ensure that they slide properly.
- Operation of the levers related to gear shifting should be made only when the front chainwheel is turning.
- If the brake fluid used in the oil disc brakes is of a type which tends to adhere to the plastic parts of the shifting lever, this may cause the plastic parts to crack or become discolored. Therefore, you should make sure that the brake fluid does not adhere to these plastic parts. The mineral oil which is used in SHIMANO disc brakes does not cause cracking or discoloration if it adheres to plastic parts, but such parts should be cleaned with alcohol beforehand to prevent foreign particles from adhering.
- Do not disassemble the shifting lever unit, as this may damage it or cause mis-operation.
- Be sure to read the service instructions for the Rear Drive System in conjunction with these service instructions (SL-M980-I).
- Parts are not guaranteed against natural wear or deterioration resulting from normal use.
- For maximum performance we highly recommend Shimano lubricants and maintenance products
- For any questions regarding methods of installation, adjustment, maintenance or operation, please contact a professional bicycle dealer.

Technical Service Instructions **SI-5M80A-002**

Front Drive System

In order to realize the best performance, we recommend that the following combination be used.

Series	XTR
Rapidfire (Shifting lever)	SL-M980-L / SL-M980-IL
Outer casing	OT-SP41 (SIS-SP41)
Front derailleur	FD-M985 / FD-M985-E / FD-M985-E2 / FD-M986 / FD-M986-D
Front chainwheel	FC-M980 / FC-M985
Chain	CN-M980
Bottom bracket cable guide	SM-SP17

Specifications

Front Derailleur

X = Available

Model number		FD-M985	FD-M985-E	FD-M985-E2	FD-M986	FD-M986-D
Normal type		X	X	X	X	X
Top route type		X	X	X	X	X
Front chainwheel tooth difference		14, 12T	14, 12T	12T	14, 12T	14, 12T
Front derailleur installation band diameter		S, M, L	–	–	S, M, L	–
Chainstay angle (α)		66° - 69°	66° - 69°	66° - 69°	66° - 69°	66° - 69°
Applicable chain line	46.8 mm	38T	–	38T	38T	38T
	48.8 mm	40-44T	40-44T	40T	40-44T	40-44T

Chainwheel

Model number	FC-M980	FC-M985		
Chainwheel tooth combination	38-26T	40-28T	42-30T	44-30T
Bolt circle diameter	104 / 64 mm	88 mm		
Crank arm length	165, 170, 175, 180 mm	170, 172.5, 175, 180 mm		
Chain line	46.8 mm	48.8 mm		
Bottom bracket shell width	68, 73 mm	68, 73 mm		
Thread dimensions	BC1.37 (68, 73mm)	BC1.37 (68, 73mm)		
Applicable bottom bracket	SM-BB90-A	SM-BB90-A		

Installation band diameters:
S (28.6 mm), M (31.8 mm), L (34.9 mm)

When using the S, M size, use an installation band with a diameter of 28.6 mm, 31.8mm and install it to a L size adapter.

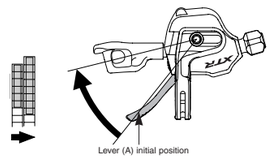
Gear shifting operation

The INSTANT RELEASE mechanism makes fast releasing possible because cable tension is released immediately when a lever is depressed.
This release lever is equipped with a 2-way release mechanism which allows release operations to be carried out by either pushing or pulling the lever.
Both lever (A) and lever (B) always return to the initial position when they are released after shifting.
When operating one of the levers, always be sure to turn the crank arm at the same time.

To shift from the smaller chainring to the larger chainring (Lever A)

When lever (A) is pressed once, there is a shift of one step from the smaller chainring to the larger chainring.

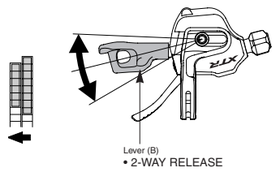
Example:
From smaller chainring to larger chainring.



To shift from the larger chainring to the smaller chainring (Lever B)

When lever (B) is pressed once, there is a shift of one step from the larger chainring to the smaller chainring.

Example:
From larger chainring to smaller chainring.



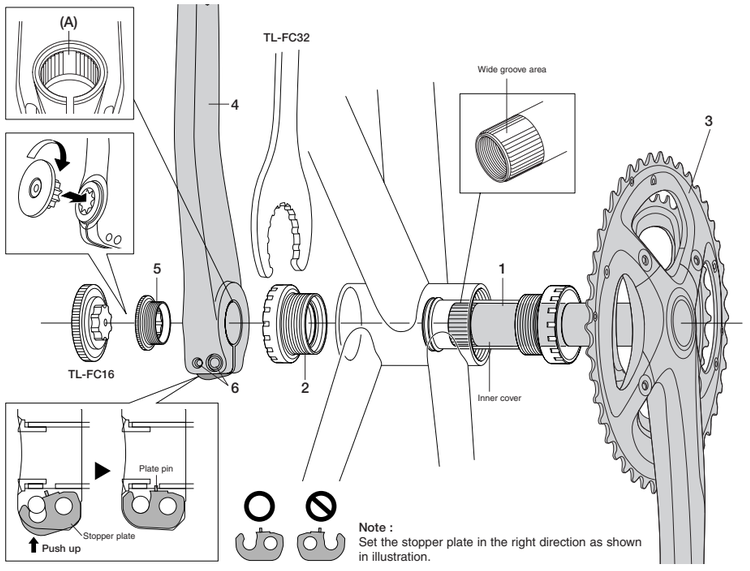
Installation of the Front Chainwheel

Follow the procedure in the figure.

1, 2 Use the special tool TL-FC32/36 to install the right adapter (counterclockwise thread) and the left adapter (clockwise thread).
Tightening torque: 35 - 50 N·m {305 - 435 in. lbs.}
Note : Spacers may be necessary depending on the bottom bracket shell width. For details, refer to "Spacer installation method".

3 Insert the right crank unit.

4 Set section A of the left crank into the axle of the right crank unit where the groove is wide.



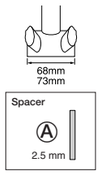
5 Use the TL-FC16/18 to tighten the cap.
Tightening torque: 0.7 - 1.5 N·m {6 - 13 in. lbs.}

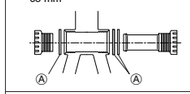
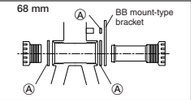
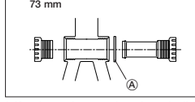
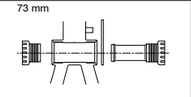
6 Push in the stopper plate and check that the plate pin is securely in place, and then tighten the bolt of the left crank arm. (5 mm Allen key)
Note : Each of the bolts should be evenly and equally tightened to 12 - 14 N·m {106 - 122 in. lbs.}.

Note :
Set the stopper plate in the right direction as shown in illustration.

■ Spacer installation method

(1) Check whether the width of the bottom bracket shell is 68 mm or 73 mm.
(2) Next, install the adapter while referring to the illustrations below.

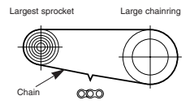


Band Type	Bracket Type
68 mm	68 mm
	
73 mm	73 mm
	

* If using a bottom bracket shell having a width of 68 mm which is a band type, an 1.8 mm spacer and a 0.7 mm spacer can be used together instead of a 2.5 mm spacer.

Chain length

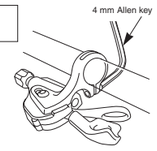
Add 2 links (with the chain on both the largest sprocket and the large chainring)



Installation of the shifting lever

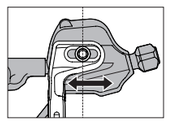
Use a handlebar grip with a maximum outer diameter of 32 mm.

Tightening torque : 3 N·m {27 in. lbs.}



The shifting lever position can be adjusted by sliding it to the left or right.

Tightening torque : 2.5 N·m {22 in. lbs.}



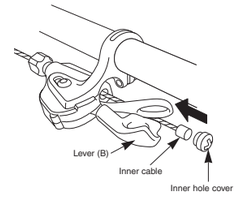
- Install the shifting lever in a position where it will not obstruct brake operation and gear shifting operation.
- Do not use in a combination which causes brake operation to be obstructed.

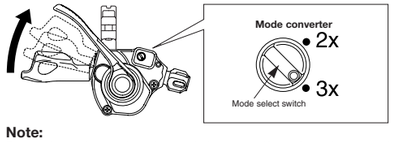
Note:
When installing the components to carbon frame/handle bar surfaces, verify with the manufacturer of the carbon frame/parts for their recommendation on tightening torque in order to prevent over tightening that can cause damage to the carbon material and/or under tightening that can cause lack of fixing strength for the components.

Refer to the FD-M985 / M985-E / M985-E2 / M986 / M986-D (Front Derailleur) Service Instructions for details on installing the front derailleur and SIS adjustment.

Connecting and securing the inner cable

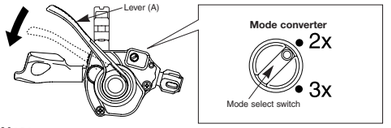
Switch the mode converter to the 3x (triple mode) position, and then check the lowest position. Operate lever B two times or more to set the lever to the lowest position. Remove the inner hole cover, and install the cable.





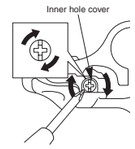
Note:
Do not force the mode select switch to turn. If you force it to turn, it will break.

Operate lever A once to set it to the middle position. Switch the mode converter to the 2x (double mode) position.



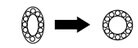
Note:
The mode converter cannot be switched while the lever is at the lowest position. Be sure to operate lever (A) one or more times before switching. Do not turn the mode converter by force, otherwise it may break.

Install the inner hole cover by turning it as shown in the illustration until it stops.
Do not turn it any further than this, otherwise it may damage the thread on the cover.

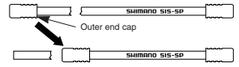


Cutting the outer casing

When cutting the outer casing, cut the opposite end to the end with the marking. After cutting the outer casing, make the end round so that the inside of the hole has a uniform diameter.

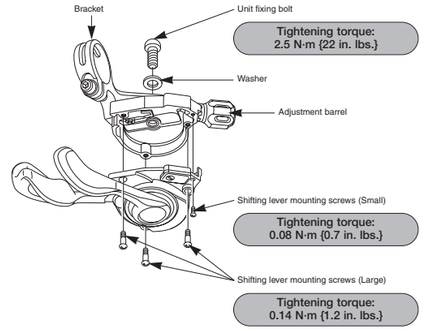


Attach the same outer end cap to the cut end of the outer casing.



Replacement of the shifting lever unit

Disassembly and reassembly should only be carried out when replacing the shifting lever unit.


Bracket
Unit fixing bolt
Tightening torque: 2.5 N·m {22 in. lbs.}
Washer
Adjustment barrel
Shifting lever mounting screws (Small)
Tightening torque: 0.08 N·m {0.7 in. lbs.}
Shifting lever mounting screws (Large)
Tightening torque: 0.14 N·m {1.2 in. lbs.}

1. Loosen the cable fixing bolt (nut) of the front derailleur, and then pull the inner cable out of the shifting lever unit in the same way as when installing the inner cable.
2. Remove the adjustment barrel.
3. First remove the unit fixing bolt.
4. Remove the four shifting lever mounting screws, and then remove the shifting lever unit as shown in the illustration.
5. To assemble, align the shifting lever unit and the bracket and then secure the shifting lever mounting screws.
6. Place the washer onto the bolt, and then secure the unit fixing bolt.
7. Install the adjustment barrel.

This service instruction explains how to use and maintain the Shimano bicycle parts which have been used on your new bicycle. For any questions regarding your bicycle or other matters which are not related to Shimano parts, please contact the place of purchase or the bicycle manufacturer.

SHIMANO

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* Service Instructions in further languages are available at :
http://techdocs.shimano.com

Please note: specifications are subject to change for improvement without notice. (English)
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SI-5M40A-003-00

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⚠ WARNING

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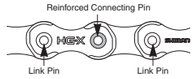
- Use the reinforced connecting pin only for connecting the narrow type of chain.
- If connecting pins other than reinforced connecting pins are used, or if a reinforced connecting pin or tool which is not suitable for the type of chain is used, sufficient connection force may not be obtained, which could cause the chain to break or fall off.

Chain	Reinforced connecting pin	Chain tool
10-speed super narrow chain for MTB	with groove (3) with groove (2)	TL-CN32 TL-CN23 TL-CN27

- If it is necessary to adjust the length of the chain due to a change in the number of sprocket teeth, make the cut at some other place than the place where the chain has been joined using a reinforced connecting pin. The chain will be damaged if it is cut at a place where it has been joined with a reinforced connecting pin.



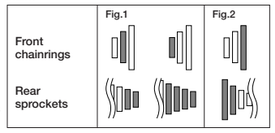
- Be careful not to let the cuffs of your clothes get caught in the chain while riding, otherwise you may fall off the bicycle.
- Check that the tension of the chain is correct and that the chain is not damaged. If the tension is too weak or the chain is damaged, the chain should be replaced. If this is not done, the chain may break and cause serious injury.
- The two left crank arm mounting bolts should be tightened alternately in stages rather than each bolt being fully tightened all at once. Use a torque wrench to check that the final tightening torques are within the range of 12 - 14 N·m. Furthermore, after riding approximately 100 km (60 miles), use a torque wrench to re-check the tightening torques. It is also important to periodically check the tightening torques. If the tightening torques are too weak or if the mounting bolts are not tightened alternately in stages, the left crank arm may come off and the bicycle may fall over, and serious injury may occur as a result.
- Check that there are no cracks in the crank arms before riding the bicycle. If there are any cracks, the crank arm may break and you may fall off the bicycle.
- If the inner cover is not installed correctly, the axle may rust and become damaged, and the bicycle may fall over and serious injury may occur as a result.
- **Obtain and read the service instructions carefully prior to installing the parts.** Loose, worn or damaged parts may cause the bicycle to fall over and serious injury may occur as a result. We strongly recommend only using genuine Shimano replacement parts.
- **Obtain and read the service instructions carefully prior to installing the parts.** If adjustments are not carried out correctly, the chain may come off and this may cause you to fall off the bicycle which could result in serious injury.
- Read these Technical Service Instructions carefully, and keep them in a safe place for later reference.

⚠ CAUTION

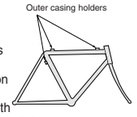
- If the chain is on the smallest or intermediate chainring, there is the danger of injury from the tips of the teeth on the largest chainring.

Note

- In addition, if pedaling performance does not feel normal, check this once more.
- Before riding the bicycle, check that there is no play or looseness in the connection. Also, be sure to retighten the crank arms and pedals at periodic intervals.
- When installing the pedals, apply a small amount of grease to the threads to prevent the pedals from sticking. Use a torque wrench to securely tighten the pedals. Tightening torque: 35 - 55 N·m {305 - 479 in. lbs.}. The right-hand crank arm has a right-hand thread, and the left-hand crank arm has a left-hand thread.
- If a squeaking noise is heard coming from the bottom bracket axle and the left crank arm connector, apply grease to the connector and then tighten it to the specified torque.
- Use a neutral detergent to clean the crank arm and the bottom bracket. Using alkaline or acidic detergents may cause discoloration.
- Do not wash the bottom bracket with high-pressure jets of water.
- If you feel any looseness in the bearings, the bottom bracket should be replaced.
- If gear shifting operations do not feel smooth, wash the derailleur and lubricate all moving parts.
- If the amount of looseness in the links is so great that adjustment is not possible, you should replace the derailleur.
- You should periodically wash the chainrings in a neutral detergent and then lubricate them again. In addition, cleaning the chain with neutral detergent and lubricating it can be an effective way of extending the useful life of the chainrings and the chain.
- If the chain keeps coming off the chainrings during use, replace the chainrings and the chain.
- When the chain is in the position shown in the illustration, the chain may contact the front chainrings or front derailleur and generate noise. If the noise is a problem, shift the chain onto the next-larger rear sprocket or the one after if the chain is in the position shown in Figure 1. Shift the chain onto the next-smaller sprocket or the one after if it is in the position shown in Figure 2.



- For frames with suspension, the chain stay angle will vary depending on whether the bicycle is being ridden or not being ridden. When the bicycle is not being ridden and the chain is positioned on the largest/larger chainring and on the smallest sprocket, the chain guide outer plate of the front derailleur may touch the chain.
- The cuffs of your clothing may get dirty from the chain while riding.
- Apply grease to the left and right adapters before installing them.
- For smooth operation, use the specified outer casing and the bottom bracket cable guide.
- This front derailleur is for triple front chainwheel use only. It cannot be used with the double front chainwheel, as the shifting points do not match.
- When installing the top route type, choose a frame that has three outer casing holders as shown in the illustration at right.



- Use an outer casing which still has some length to spare even when the handlebars are turned all the way to both sides. Furthermore, check that the shifting lever does not touch the bicycle frame when the handlebars are turned all the way.
- A special grease is used for the gear shifting cable. Do not use DURA-ACE grease or other types of grease, otherwise they may cause deterioration in gear shifting performance.
- Grease the inner cable and the inside of the outer casing before use to ensure that they slide properly.
- Operation of the levers related to gear shifting should be made only when the front chainwheel is turning.
- If the brake fluid used in the oil disc brakes is of a type which tends to adhere to the plastic parts of the shifting lever, this may cause the plastic parts to crack or become discolored. Therefore, you should make sure that the brake fluid does not adhere to these plastic parts. The mineral oil which is used in SHIMANO disc brakes does not cause cracking or discoloration if it adheres to plastic parts, but such parts should be cleaned with alcohol beforehand to prevent foreign particles from adhering.
- Do not disassemble the shifting lever unit, as this may damage it or cause mis-operation.
- Be sure to read the service instructions for the Rear Drive System in conjunction with these service instructions (SL-M980-I).
- Parts are not guaranteed against natural wear or deterioration resulting from normal use.
- For maximum performance we highly recommend Shimano lubricants and maintenance products
- For any questions regarding methods of installation, adjustment, maintenance or operation, please contact a professional bicycle dealer.

SI-5M40A-003 Technical Service Instructions

Front Drive System

In order to realize the best performance, we recommend that the following combination be used.

Series	XTR
Rapidfire (Shifting lever)	SL-M980-L / SL-M980-IL
Outer casing	OT-SP41 (SIS-SP41)
Front derailleur	FD-M980 / FD-M980-E / FD-M981 / FD-M981-D
Front chainwheel	FC-M980
Chain	CN-M980
Bottom bracket cable guide	SM-SP17

Specifications

Front Derailleur

X = Available

Model number	FD-M980	FD-M980-E	FD-M981	FD-M981-D
Normal type	X			
Top route type	X			
Front chainwheel tooth difference	18T			
Min. difference between top and intermediate	10T			
Front derailleur installation band diameter	S, M, L	–	S, M, L	–
Chainstay angle (α)	66° - 69°			
Applicable chain line	50 mm			

Chainwheel

Model number	FC-M980
Chainwheel tooth combination	42-32-24T
Bolt circle diameter	104 mm / 64 mm
Crank arm length	165 mm, 170 mm, 175 mm, 180 mm
Chain line	50 mm
Bottom bracket shell width	68, 73 mm
Thread dimensions	BC1.37 (68, 73mm)
Bottom bracket adapters	SM-BB90-A

Installation band diameters:
S (28.6 mm), M (31.8 mm), L (34.9 mm)

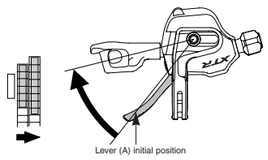
When using the S, M size, use an installation band with a diameter of 28.6 mm, 31.8mm and install it to a L size adapter.

Gear shifting operation

The INSTANT RELEASE mechanism makes fast releasing possible because cable tension is released immediately when a lever is depressed.
This release lever is equipped with a 2-way release mechanism which allows release operations to be carried out by either pushing or pulling the lever.
Both lever (A) and lever (B) always return to the initial position when they are released after shifting.
When operating one of the levers, always be sure to turn the crank arm at the same time.

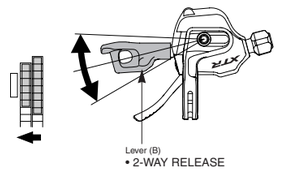
To shift from a small chainring to a larger chainring (Lever A)
When lever (A) is pressed once, there is a shift of one step from a small chainring to a larger chainring.

Example:
from intermediate chainring to largest chainring.



To shift from a large chainring to a smaller chainring (Lever B)
When lever (B) is pressed once, there is a shift of one step from a large chainring to a smaller chainring.

Example:
from largest chainring to intermediate chainring.



Installation of the Front Chainwheel

Follow the procedure in the figure.

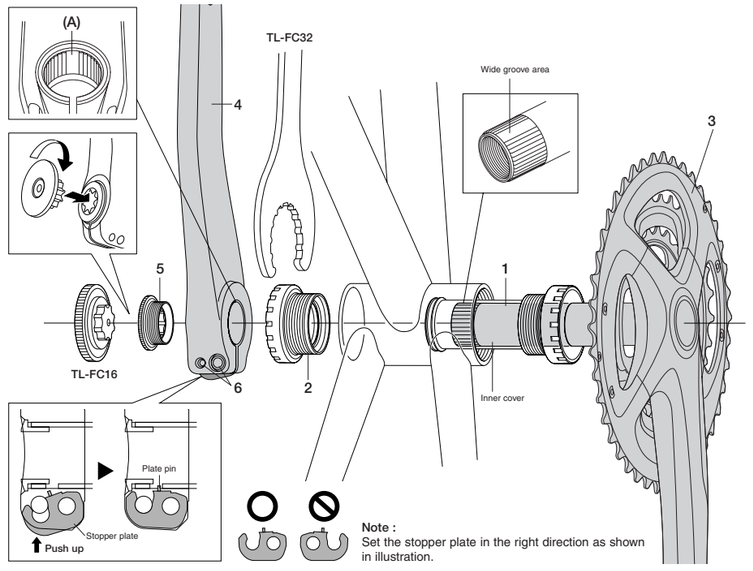
1, 2 Use the TL-FC32/33/36 special tool to install the right adapter (counterclockwise thread) of the bottom bracket, the inner cover and the left adapter (clockwise thread) of the bottom bracket.
Tightening torque: 35 - 50 N·m {305 - 435 in. lbs.}
Note : Spacers may be necessary depending on the bottom bracket shell width. For details, refer to "Spacer installation method".

3 Insert the right crank arm unit.

4 Set section A of the left crank arm into the axle of the right crank arm unit where the groove is wide.

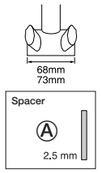
5 Use the TL-FC16/18 to tighten the cap.
Tightening torque: 0.7 - 1.5 N·m {6 - 13 in. lbs.}

6 Push in the stopper plate and check that the plate pin is securely in place, and then tighten the bolt of the left crank arm. (5 mm Allen key)
Note : Each of the bolts should be evenly and equally tightened to 12 - 14 N·m {106 - 122 in. lbs.}.

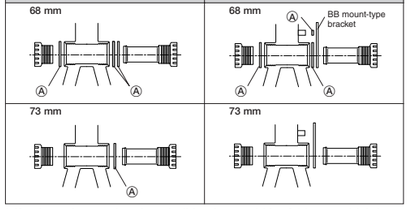


■ Spacer installation method

(1) Check whether the width of the bottom bracket shell is 68 mm or 73 mm.
(2) Next, install the adapter while referring to the illustrations below.



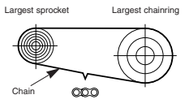
Band Type	Bracket Type
68 mm	68 mm
73 mm	73 mm



* If using a bottom bracket shell having a width of 68 mm which is a band type, an 1.8 mm spacer and a 0.7 mm spacer can be used together instead of a 2.5 mm spacer.

Chain length

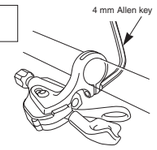
Add 2 links (with the chain on both the largest sprocket and the largest chainring)



Installation of the shifting lever

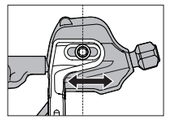
Use a handlebar grip with a maximum outer diameter of 32 mm.

Tightening torque : 3 N·m {27 in. lbs.}



The shifting lever position can be adjusted by sliding it to the left or right.

Tightening torque : 2.5 N·m {22 in. lbs.}



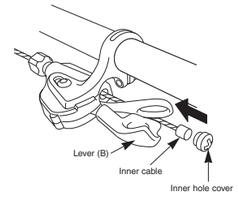
- Install the shifting lever in a position where it will not obstruct brake operation and gear shifting operation.
- Do not use in a combination which causes brake operation to be obstructed.

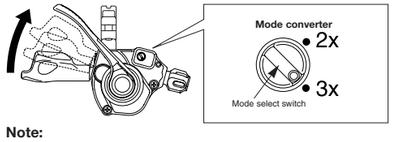
Note:
When installing the components to carbon frame/handle bar surfaces, verify with the manufacturer of the carbon frame/parts for their recommendation on tightening torque in order to prevent over tightening that can cause damage to the carbon material and/or under tightening that can cause lack of fixing strength for the components.

Refer to the FD-M980 / M980-E / M981 / M981-D (Front Derailleur) Service Instructions for details on installing the front derailleur and SIS adjustment.

Connecting and securing the inner cable

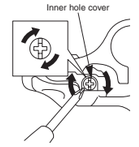
Switch the mode converter to the 3x (triple mode) position, and then check the lowest position. Operate lever B two times or more to set the lever to the lowest position. Remove the inner hole cover, and install the cable.





Note:
Do not force the mode select switch to turn. If you force it to turn, it will break.

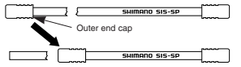
Install the inner hole cover by turning it as shown in the illustration until it stops.
Do not turn it any further than this, otherwise it may damage the thread on the cover.



Cutting the outer casing

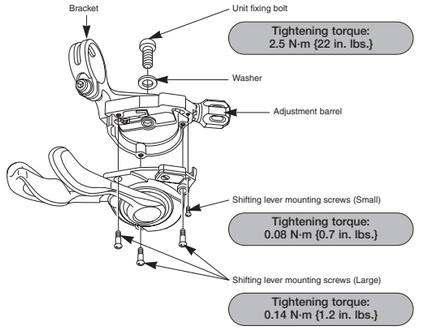
When cutting the outer casing, cut the opposite end to the end with the marking. After cutting the outer casing, make the end round so that the inside of the hole has a uniform diameter.

Attach the same outer end cap to the cut end of the outer casing.



Replacement of the shifting lever unit

Disassembly and reassembly should only be carried out when replacing the shifting lever unit.



1. Loosen the cable fixing bolt (nut) of the front derailleur, and then pull the inner cable out of the shifting lever unit in the same way as when installing the inner cable.
2. Remove the adjustment barrel.
3. First remove the unit fixing bolt.
4. Remove the four shifting lever mounting screws, and then remove the shifting lever unit as shown in the illustration.
5. To assemble, align the shifting lever unit and the bracket and then secure the shifting lever mounting screws.
6. Place the washer onto the bolt, and then secure the unit fixing bolt.
7. Install the adjustment barrel.

This service instruction explains how to use and maintain the Shimano bicycle parts which have been used on your new bicycle. For any questions regarding your bicycle or other matters which are not related to Shimano parts, please contact the place of purchase or the bicycle manufacturer.

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* Service Instructions in further languages are available at :
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Please note: specifications are subject to change for improvement without notice. (English)
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SI-6T70A-001-00

General Safety Information

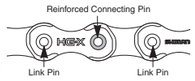
⚠ WARNING

"Maintenance interval depends on the usage and riding circumstances. Clean regularly the chain with an appropriate chaincleaner. Never use alkali based or acid based solvents such as rust cleaners. If those solvent be used chain might break and cause serious injury."

- **In order to obtain good gear shifting performance, this chain has a forward side and a reverse side, and the sides are marked so that the chain will face the correct way when installed. The proper design performance will be obtained when the chain is installed so that it faces the correct way. If it is installed so that it faces the opposite way, the chain may come off and the bicycle may fall over and serious injury may occur as a result.**
- Check that the wheels are fastened securely before riding the bicycle. If the wheels are loose in any way, they may come off the bicycle and serious injury may result.
- Use the reinforced connecting pin only for connecting the narrow type of chain.

Chain	Reinforced connecting pin	Chain tool
10-speed super narrow chain for MTB	with groove (3) / with groove (2)	TL-CN32 TL-CN23 TL-CN27

- If connecting pins other than reinforced connecting pins are used, or if a reinforced connecting pin or tool which is not suitable for the type of chain is used, sufficient connection force may not be obtained, which could cause the chain to break or fall off.
- If it is necessary to adjust the length of the chain due to a change in the number of sprocket teeth, make the cut at some other place than the place where the chain has been joined using a reinforced connecting pin. The chain will be damaged if it is cut at a place where it has been joined with a reinforced connecting pin.



- Check that the tension of the chain is correct and that the chain is not damaged. If the tension is too weak or the chain is damaged, the chain should be replaced. If this is not done, the chain may break and cause serious injury.
- **Obtain and read the service instructions carefully prior to installing the parts.** Loose, worn or damaged parts may cause the bicycle to fall over and serious injury may occur as a result. We strongly recommend only using genuine Shimano replacement parts.
- **Obtain and read the service instructions carefully prior to installing the parts.** If adjustments are not carried out correctly, the chain may come off and this may cause you to fall off the bicycle which could result in serious injury.
- Read these Technical Service Instructions carefully, and keep them in a safe place for later reference.

Note

- If gear shifting operations do not feel smooth, wash the derailleur and lubricate all moving parts.
- If the amount of looseness in the links is so great that adjustment is not possible, you should replace the derailleur.
- You should periodically clean the derailleur and lubricate all moving parts (mechanism and pulleys).
- If gear shifting adjustment cannot be carried out, check the degree of parallelism at the rear end of the bicycle. Also check if the cable is lubricated and if the outer casing is too long or too short.
- If you hear abnormal noise as a result of looseness in a pulley, you should replace the pulley.
- If the wheel becomes stiff and difficult to turn, you should lubricate it with grease.
- Do not apply any oil to the inside of the hub, otherwise the grease will come out.
- You should periodically wash the sprockets in a neutral detergent and then lubricate them again. In addition, cleaning the chain with neutral detergent and lubricating it can be a effective way of extending the useful life of the sprockets and the chain.
- If the chain keeps coming off the sprockets during use, replace the sprockets and the chain.
- Use a frame with internal cable routing is strongly discouraged as it has tendencies to impair the SIS shifting function due to its high cable resistance.
- Always be sure to use the sprocket set bearing the same group marks. Never use in combination with a sprocket bearing a different group mark.

- Use an outer casing which still has some length to spare even when the handlebars are turned all the way to both sides. Furthermore, check that the shifting lever does not touch the bicycle frame when the handlebars are turned all the way.
- A special grease is used for the gear shifting cable. Do not use DURA-ACE grease or other types of grease, otherwise they may cause deterioration in gear shifting performance.
- Grease the inner cable and the inside of the outer casing before use to ensure that they slide properly.
- For smooth operation, use the specified outer casing and the bottom bracket cable guide.
- Operation of the levers related to gear shifting should be made only when the front chainwheel is turning.
- If the brake fluid used in the oil disc brakes is of a type which tends to adhere to the plastic parts of the shifting lever, this may cause the plastic parts to crack or become discolored. Therefore, you should make sure that the brake fluid does not adhere to these plastic parts.
  The mineral oil which is used in SHIMANO disc brakes does not cause cracking or discoloration if it adheres to plastic parts, but such parts should be cleaned with alcohol beforehand to prevent foreign particles from adhering.
- Do not disassemble the shifting lever unit, as this may damage it or cause mis-operation.
- Parts are not guaranteed against natural wear or deterioration resulting from normal use.
- Read these Service Instructions in conjunction with the Service Instructions for the FH-M985 / M988.
- For maximum performance we highly recommend Shimano lubricants and maintenance products
- For any questions regarding methods of installation, adjustment, maintenance or operation, please contact a professional bicycle dealer.

Technical Service Instructions SI-6T70A-001

Rear Drive System

In order to realize the best performance, we recommend that the following combination be used.

Series	XTR
RAPIDFIRE (Shifting lever)	SL-M980-R / SL-M980-IR
Outer casing	OT-SP41 (SIS-SP41)
Rear derailleur	RD-M980
Type	SGS / GS
Freehub	FH-M985 / FH-M988
Gears	10
Cassette sprocket	CS-M980 / CS-M771-10
Chain	CN-M980
Bottom bracket guide	SM-SP17 / SM-BT17

This service instruction explains how to use and maintain the Shimano bicycle parts which have been used on your new bicycle. For any questions regarding your bicycle or other matters which are not related to Shimano parts, please contact the place of purchase or the bicycle manufacturer.

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Please note: specifications are subject to change for improvement without notice. (English)
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Specifications

Rear Derailleur

Model number	RD-M980	
Type	SGS	GS
Gears	10	
Total capacity	41 T	35 T
Largest sprocket	36 T	36 T
Smallest sprocket	11 T	11 T
Front chainwheel tooth difference	18 T	18 T

Cassette sprocket tooth combination

Model number	Group name	Gears	Tooth combination
CS-M980	**bJ**	10	11, 13, 15, 17, 19, 21, 23, 26, 30, 34 T
	bk	10	11, 13, 15, 17, 19, 21, 24, 28, 32, 36 T
CS-M771-10	**bL**	10	11, 12, 14, 16, 18, 20, 22, 25, 28, 32 T

Freehub

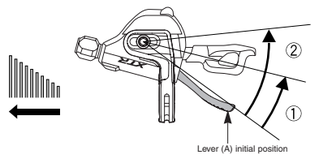
Model number	FH-M985 / FH-M988
Gears	10
No. of spoke holes	32

Gear shifting operation

The INSTANT RELEASE mechanism makes fast releasing possible because cable tension is released immediately when a lever is depressed. The levers are also equipped with 2-WAY RELEASE and MULTI RELEASE mechanisms so that you can now shift two gears with a single operation, either by pushing or pulling the lever.
Both lever (A) and lever (B) always return to the initial position when they are released after shifting. When operating one of the levers, always be sure to turn the crank arm at the same time.

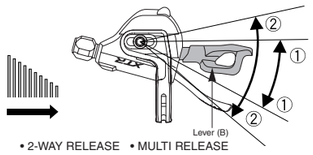
To shift from a small sprocket to a larger sprocket (Lever A)

You can vary the lever stroke to shift the desired number of gears, so that to shift by one gear only, move the lever to the (1) position, and to shift by two gears at one time, move the lever to the (2) position. A maximum two-gear shift can be made in this manner.



To shift from a large sprocket to a smaller sprocket (Lever B)

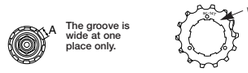
You can vary the lever stroke to shift the desired number of gears, so that to shift by one gear only, move the lever to the (1) position, and to shift by two gears at one time, move the lever to the (2) position. A maximum two-gear shift can be made in this manner.

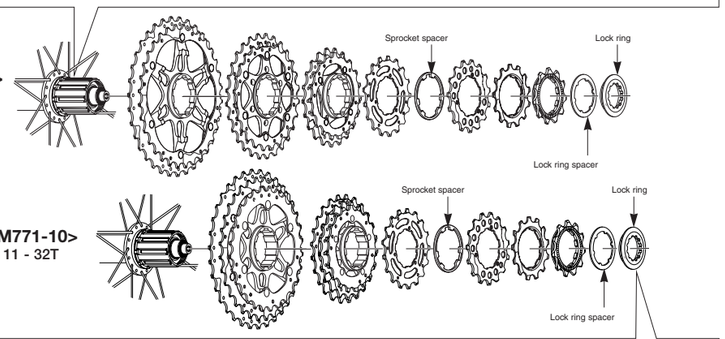


• 2-WAY RELEASE • MULTI RELEASE

Installation of the sprockets

For each sprocket, the surface that has the group mark should face outward and be positioned so that the wider part of each sprocket and the A part (where the groove width is wide) of the freewheel body are aligned.

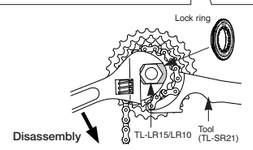




For installation of the HG sprockets, use the special tool (TL-LR15/LR10) to tighten the lock ring.

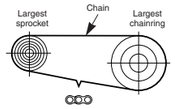
Tightening torque: 30 - 50 N·m {261 - 434 in. lbs.}

To replace the HG sprockets, use the special tool (TL-LR15/LR10) and TL-SR21 to remove the lock ring.

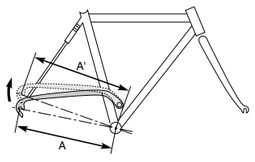


Chain length on bicycles with rear suspension

The length of A will vary depending on the movement of the rear suspension. Because of this, an excessive load may be placed on the drive system if the chain length is too short. Set the length of the chain by adding two links to the chain when the rear suspension is at a position where dimension "A" is longest and the chain is on the largest sprocket and the largest chainring. If the amount of movement of the rear suspension is large, the slack in the chain may not be taken up properly when the chain is on the smallest chainring and smallest sprocket.



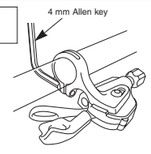
Add 2 links (with the chain on both the largest sprocket and the largest chainring)



Installation of the shifting lever (SL-M980-R)

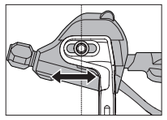
Use a handlebar grip with a maximum outer diameter of 32 mm.

Tightening torque: 3 N·m {27 in. lbs.}



Shifting lever position is adjustable by sliding to left or right.

Tightening torque : 2.5 N·m {22 in. lbs.}



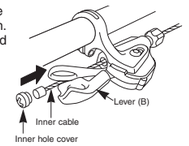
- Install the shifting lever in a position where it will not obstruct brake operation and gear shifting operation.
- Do not use in a combination which causes brake operation to be obstructed.

Note:
When installing the components to carbon frame/handle bar surfaces, verify with the manufacturer of the carbon frame/parts for their recommendation on tightening torque in order to prevent over tightening that can cause damage to the carbon material and/or under tightening that can cause lack of fixing strength for the components.

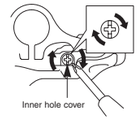
Refer to the RD-M980 (Rear Derailleur) Service Instructions for details on installing the rear derailleur and SIS adjustment.

Connection and securing of the inner cable

Operate the lever (B) 9 times or more to set the lever to the highest position. Then remove the inner hole cover and connect the inner cable.



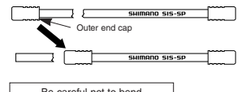
Install the inner hole cover by turning it as shown in the illustration until it stops.
Do not turn it any further than this, otherwise it may damage the screw thread.



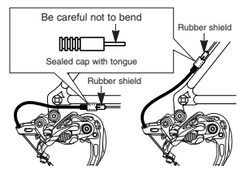
Cutting the outer casing

When cutting the outer casing, cut the opposite end to the end with the marking. After cutting the outer casing, make the end round so that the inside of the hole has a uniform diameter.

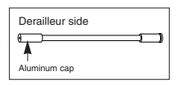
Attach the same outer end cap to the cut end of the outer casing.



The sealed cap with tongue and the rubber shield should be installed to the outer casing stopper of the frame.



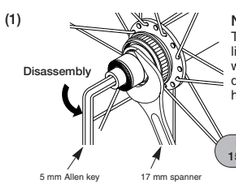
* If the rear derailleur moves to a large degree, such as in bicycles with rear suspension, it is recommended that you replace the cap with an aluminum cap. The end of the outer casing which has the aluminum cap should be at the derailleur side.



Replacement of the freewheel body (FH-M985)

First, pull out the hub axle by following the procedure shown in the illustration.
The double-lock section at the freewheel side cannot be disassembled.

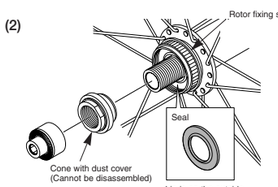
(1)



Note:
The hub cone is made from a light alloy. Use a suitable tool which has no wear or other damage when adjusting the hub rotation.

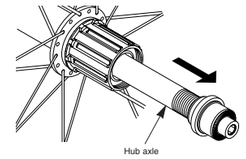
Left side Tightening torque: 15 - 20 N·m {132 - 172 in. lbs.}

(2)

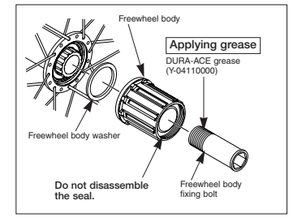


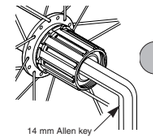
Note:
- When removing and installing the seal, do it very carefully so that the seal does not become bent.
  When reinstalling the seal, make sure that it is facing the right way, and insert it as far as it will go.
- Do not disassemble the dust cover which is crimped onto the cone.

(3)



(4) After removing the hub axle, remove the freewheel body fixing bolt (inside the freewheel body), and then replace the freewheel body.





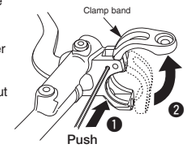
Tightening torque: 45 - 50 N·m {392 - 434 in. lbs.}

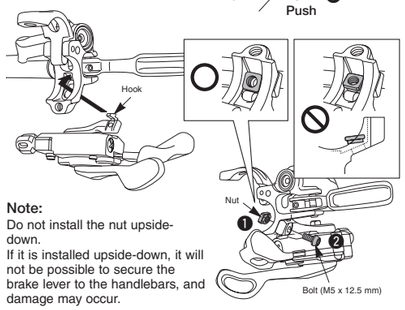
Note:
When replacing the freewheel body, replace the freewheel body fixing bolt at the same time. Be sure to apply grease to the the thread of the freewheel body fixing bolt, otherwise looseness or sticking may occur.
Do not attempt to disassemble the freewheel body, because it may result in a malfunction.

Installation of the SL-M980-I and the BL-M985/M988

Brake levers \ Shifting lever	SL-M980-I
BL-M985 / M988	OK
Other Brake lever models	Not compatible

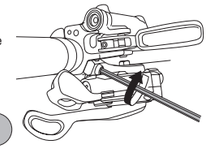
1. Use a 2 mm Allen key to open the clamp band of the brake lever as shown in the illustration.
2. Insert the hook of the shifting lever bracket into the hole in the brake lever bracket, and then provisionally tighten the special nut and special bolt to install it to the handlebar.





Note:
Do not install the nut upside-down.
If it is installed upside-down, it will not be possible to secure the brake lever to the handlebars, and damage may occur.

3. Use a 4 mm Allen key to secure the shifting lever to the brake lever.



Tightening torque: 3 N·m {27 in. lbs.}

- ■ **Read these Service Instructions together with the Service Instructions for the BR-M985 (SI-8J70A).**
- ■ **Refer to the Service Instructions for the Front Drive System for details on replacing and installing the shifting lever unit.**